

## **Landpower and Network-Centric Operations: How Information in Today's Battlespace can be Exploited**

By

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Finally, the general unreliability of all information presents a special problem in war: All action takes place, so to speak, in a kind of twilight, which like fog or moonlight, often tends to make things seem grotesque and larger than they really are. Whatever is hidden from full view is this feeble light has to be guessed at by talent, or simply left to chance. So once again for lack of objective knowledge one has to trust to talent or to luck.

Clausewitz<sup>1</sup>

Most warfighters would probably agree with Clausewitz about the general unreliability of information on the battlefield. LTC Ernest Marcone, commander 3<sup>rd</sup> battalion 69<sup>th</sup> Armor of the Third Infantry Division, articulates the problem associated with quality and timely information during his mission to secure a key bridge in April 2003 during Operation Iraqi Freedom. "Next to the fall of Baghdad . . . that bridge [Objective Peach] was the most important piece of terrain in the theater, and no one can tell me what's defending it. Not how many troops, what units, what tanks, anything."<sup>2</sup> However, this does not mean that warfighters should accept this condition as the cost of doing business in war. The Department of Defense has taken on improving the quality of information on the battlefield and enhancing shared situational awareness. Network Centric Warfare continues to be a cornerstone of defense and military transformation. So, while Marcone recognized that the U.S. intelligence apparatus did not have a good read on enemy forces, his situational awareness of friendly forces allowed him to determine when his reinforcements would arrive. Consequently, he was able to make informed decisions that allowed him to gain advantage he would not otherwise have had.<sup>3</sup> The lessons learned from V Corps during Operation Iraqi Freedom begin to frame the implications for a networked force at the operational level of war with the ability to acquire more timely and accurate information during combat operations. Networked command and control systems enabled innovative approaches to collaboration, sharing information, gaining situational awareness, and synchronizing joint fires.

The concept and theories associated with Network Centric Warfare (NCW) have been bantered about since early in 1998.<sup>4</sup> The data to support claims of "increased mission effectiveness" through robustly networked forces is now becoming available. This essay will examine the tenets of NCW in the context of the V Corps fight during Operation Iraqi Freedom (OIF). The Center for Strategic Leadership, U.S. Army War College, is scheduled to release a study for the Office of Force Transformation, Office of the Secretary of Defense, examining V Corps major combat operations during OIF sometime in mid-2006. The researchers conducted qualitative analysis of 50 personal interviews with participants of all ranks. Also, the research team gathered statistical data from over 500 survey responses. Although the study focused at the tactical level, the data will be used to articulate the enabling potential of NCW at the operational level of war. This essay will explore the implications of the NCW at the operational level of war by examining V Corps operations during the battle of the Karbala Gap. V Corps conducted network centric operations using a series of new technologies to command and control five simultaneous battles. The relationship between sensors, shooters, and command and control will highlight the benefits of a networked force in information age warfare. The journey toward achieving enhanced situational awareness to increase mission

effectiveness is in its early stages. Additionally, the data acquired from the study points to several important recommendations to proceed with the implementation of NCW capabilities across the force.

### **Network Centric Operations**

Network Centric Warfare (NCW) is not simply focused on technological solutions, but rather on how these solutions affect individual and collective behavior in military organizations. NCW is about enhancing combat power through shared awareness. At the center of network centric operations (operations enhanced by a robust network) remains the commander; however a mature network centric force shares information readily across commands, platforms, sensors and shooters.<sup>5</sup> NCW is not about: changing the nature of war; substituting the network for military force; or replacing all other older forces and forms of warfare.<sup>6</sup>

Network Centric Warfare subscribes to the following tenets:

- A robustly networked force improves information sharing;
- Information sharing and collaboration enhances the quality of information and shared situational awareness;
- Shared situational awareness enables collaboration and self synchronization, and enhances sustainability and speed of command;
- These in turn dramatically increase mission effectiveness.<sup>7</sup>

Given these tenets the War College case study evaluates the hypothesis that improved sensors, connectivity systems, and networked information technologies improved battlespace situational awareness, understanding, decision making and collaboration, which enhanced the combat effectiveness of US V Corps and its subordinate units. V Corps and 3 ID operations were characterized by their very high operational tempo, widely dispersed forces, and for the first time in major combat, a near real time common operational picture (COP). The case study merges network centric warfare theory with practice and in doing so shows the benefit of network enhanced operations.<sup>8</sup>

### **Technology: Enhancing Situational Awareness**

As stated above, this article is not about defending NCW as an emerging theory of war. There have been numerous articles written by scholars and warfighters defending or refuting this position. The reality is that NCW is already being implemented by units in the field. In fact, one may argue that, theory and practice having now merged, the concept is no longer transformational, but an accepted and enduring part of current and future combat. This article examines the emerging evidence from OIF that demonstrates the fundamental tenets of NCW provide value added in the battlespace at the tactical and operational levels of war. V Corps benefited from several advanced technologies that assisted the commander in gaining enhanced information sharing and situational awareness to effectively synchronize joint fires. These technologies aided in network-centric battle command and control during Operation Iraqi Freedom. The combination of several key systems provided the improved quality of information, collaboration, and

increased situational awareness: Advanced Deep Operations Coordination System (ADOCS), Blue Force Tracker, Hunter Unmanned Aerial Vehicle, and Tactical Satellite Communications.

The V Corps Fires Effects Coordination Center (FECC) used ADOCS to integrate command, control, communications, information and surveillance and reconnaissance (C4ISR) systems to track and produce products to visualize targeting, airspace, and operations.<sup>9</sup> ADOCS started out as a Defense Advanced Research Projects Agency technology. The beauty of ADOCS is in its ability to integrate numerous defense and Army information technologies to facilitate production of a COP.<sup>10</sup> This integration function provided a means to quickly gain and maintain situational awareness throughout the Corps fight with regard to fires and air deconfliction. ADOCS distributed fires information vertically and horizontally across the Corps. This advanced information system begins to demonstrate the power of integrating numerous sensors on the battlefield to aid in the decision-making process. The days of developing a friendly and enemy situation through only voice communications, acetate, and maps is on the way out. ADOCS facilitates real-time updates of friendly and enemy situations to enable commanders the ability to quickly adjust fires (close air support and artillery) based on the commander's intent. This is not to say the ADOCS and its digital integration of numerous sensors can completely provide total situational awareness by eliminating all of the fog and friction associated with combat.

It is a combination of modern information technology that aids the commander to increase the speed of command through enhanced situational awareness. Another key piece of the Corps' network-centric capabilities was the Hunter Unmanned Aerial Vehicle (UAV). Hunter is one example of the significant contribution of sensors during combat operations. Its ability to gain real time enemy information and battlefield damage assessment (BDA) across the depth and breadth of the battle space was an invaluable tool to validate commander's Priority Information Requests (PIR) and develop targeting data. The Hunter UAV provides the following capabilities:

- 12 hour loiter time;
- Near real time imagery intelligence;
- Day and night surveillance with TV camera and Forward Looking Infrared technologies;
- Laser designation to adjust joint precision fires;
- Over the horizon communications payload.<sup>11</sup>

The Hunter UAV provided accurate enemy target locations integrated into the ADOCS to provide an effective combination of tools to plan the implementation of joint fires.

The demand for UAV support has only increased over time in Iraq. There are currently well over 1,000 unmanned aerial vehicles in use today fighting the insurgency. Lt. Gen. Walter Buchanan, commander of the 9<sup>th</sup> Air Force and Central Command Air Forces, recently stated, "Even with 21,000 jammers on the battlefield and 1,000 unmanned vehicles in the air, both are still in high demand because of their effectiveness

in countering insurgent attacks, so more are on the way.”<sup>12</sup> The proliferation of UAVs in Iraq and the call for even more capability is a testament to the value added this technology brings to both the conventional and unconventional fight. ADOCS and Hunter UAV alone don’t portray the entire architecture that enhanced situational awareness during Operation Iraqi Freedom.

The Force XXI Battle Command Brigade and Below (FBCB2) Blue Force Tracker (BFT) (satellite-based system), provided an automated network enabled command and control system for brigade size units and below. The FBCB2/BFT system used during Operation Iraqi Freedom allowed battlefield information to be viewed in near-real time by tactical maneuver units as well as at the highest strategic levels of command. This proliferation of current and relevant battlefield information hints at the implications of NCW at the operational and strategic levels of command. FBCB2/BFT gave the commanders at all levels excellent situational awareness of friendly tactical units on the battlefield and represented a true breakthrough in capability. BFT fed the COP the Blue Force position data in near-real time. As stated earlier, there is much work to be done to develop systems that accurately portray and distribute the friendly and enemy real-time situation vertically and horizontally across the battlespace. The combination of ADOCS, Hunter UAV, and Blue Force Tracker enabled new levels of battlefield visualization. LTG Wallace, V Corps Commander during Operation Iraqi Freedom, stated, “I saw more of the battlefield than I ever expected. . . Not since the days of Napoleon (when he could see the entire battle from his position) had senior commanders been able to see all of their force on the battlefield.”<sup>13</sup> The success of sensor systems and command and control systems is still evolving. The icons and digitization of units on electronic maps were not enough to provide the appropriate battlefield context alone. The “Spitfire” Single Channel Tactical Satellite (S/C TACSAT) System (AN/ PSC 5) provided critically important voice communications to enhance situational awareness and unity of effort.

The glue that bound the entire advanced technology network together during the operation was TACSAT. The advanced technology systems outlined to this point cannot ensure synchronization, unity of effort, and understanding commander’s intent. These systems do provide an increased awareness of enemy and friendly activity in the form of battlefield visualization. Voice communications provided the level of human interaction, collaboration, and understanding required to articulate commander’s intent to ensure unity of effort in fast pace tactical situations. TACSAT facilitated voice communications at the division and corps levels during the operation. LTG Wallace had an immense challenge to coordinate the V Corps fight with units dispersed well over 600 kilometers. The digital systems did a good job portraying the general location of maneuver forces in the battlespace. However, it was the voice communications provided by TACSAT that facilitated the articulation of his intent to subordinate commanders. “TACSAT was our push to talk Corps command net. . . . Something we did not have before . . . . What was important was hearing what was going on. . . . I would rather see a picture and hear a description of what is going on.”<sup>14</sup> It was the voice communication element of the information system (IS) architecture that provided meaning and context to the icons on the electronic maps.

It should be noted that there were insufficient satellite voice communication capabilities across the Corps. In fact, satellite communication equipment to include available channels was a limited resource. The U.S. Army War College study validates a “connectivity gap” at battalion and below. Future research should examine the proper distribution of satellite voice communication capabilities to facilitate effective network-battle command.

### **NCW: Value Added at the Operational and Strategic Levels of War**

The extended connectivity and associated improved information sharing provided by the systems outlined above allowed V Corps and 3 ID to both fight widely dispersed over extended distances, rapidly task organize, and fully integrate newly arrived units into combat operations. Some of the key findings of the War College study are shown here:

- Increased connectivity and the flow of information provided freedom to command regardless of location. The network allows the commander to move about the battlespace and maintain command anywhere in the battlespace. Where connectivity capability exists, the commander is “untethered” and can conduct “battle command on the move.” This is true for the corps, division, and cavalry squadron commanders.
- On the whole, commanders made better decisions quicker and with more confidence because of the information they had readily available to them. The information systems did not make the decisions. There was still plenty of fog and friction. Most interestingly, the study found that with the shared common operating picture and the commanders’ ability to interact with each other that decision making changed from a staff centered planning focused process to a commander centered execution focused process;
- Information systems and the “richness” they provided changed the way upper echelon staffs functioned. Staffs spent less time gathering data. They had more time for analysis and synthesis and shifted to more execution based support for the commander’s directed course of action rather than course of action development. This worked in a parallel “benevolent hierarchy” with senior and subordinate staff counterparts to meet the commander’s intent;
- Voice communications were the primary means of gaining situational understanding and ensuring unity of command and/or effort at all levels. As indicated above, the wide band single channel TACSAT was critical to success. This was the only reliable means of long range communications and a primary situational awareness tool. The use of the TACSAT for command nets at the Corps and Division created a “fish bowl” effect where anyone able to monitor the net gained increased situational awareness and understanding. This combined with the common operational picture provided a significant synergy beyond the individual capabilities of either system;
- Increased situational awareness had a significant positive impact on risk taking. Increased risk tolerance was reflected in boldness and audacity. One senior commander indicated he could assume a risk, discover he’d made a mistake and correct it before the enemy realized he’d taken the initial action.<sup>15</sup>

These findings support the theory that “NCW has the potential to contribute to the coalescence of the tactical, operational and strategic levels of war”<sup>16</sup> and point to some important operational and strategic implications gleaned from this tactical operation. Perhaps most telling are the effects of the enabling nature of NCW on operational maneuver, Joint Reception, Staging, Onward Movement and Integration (JRSOI) of forces in theater, and strategic and operational leadership (to include impacts on staff actions and planning).

First, consider the battle of Karbala Gap in terms of its implications for the use of operational maneuver to set the conditions for effective operational fires. The Karbala Gap while narrow and somewhat hilly was still the best avenue approach to Baghdad since it avoided concentration of enemy forces. The Iraqi forces were, in fact, arrayed on the east side of the Euphrates River. The attack to establish the conditions for a follow on effort at Karbala was conducted by the 2<sup>nd</sup> Brigade of the 3<sup>rd</sup> Infantry Division as the main effort, but it was expanded and supported by four other simultaneous attacks that applied pressure to the Iraqis across the entire Corps depth. This attack along multiple fronts drew out the Republican Guard forces in daylight allowing their decimation by fires (Figure 1).<sup>17</sup>

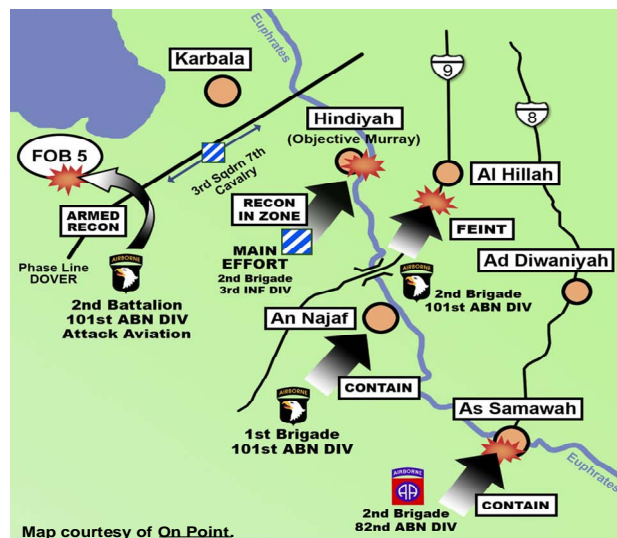


Figure 1 (Map Courtesy of *On Point*)

Wallace noted that: “... it was one of those classic cases of a maneuver action setting up operational fires, which in turn set up for a successful decisive maneuver, which took place the following day and over the following 48 hours. Because 48 hours later, we owned Baghdad International Airport and Objective SAINTS. We had begun the encirclement of Baghdad. From my perch, my perspective, my retrospection, that was a tipping point in the campaign.”<sup>18</sup>

Shared situational awareness allowed the commander to control his disparate forces and the maneuver of land forces created the conditions for fires (land and air) to decimate the enemy forces with minimal friendly losses. The fires themselves were timely and accurate due to the real time interface of the Hunter UAV and ADOCS and the parallel sharing of information.

Joint Reception, Staging, Onward Movement and Integration of forces (JRSOI) also benefited from the shared situational awareness that the network provided the command. JRSOI is “a phase of joint force projection occurring in the operational area. This phase comprises the essential processes required to transition arriving personnel, equipment, and materiel into forces capable of meeting operational requirements.”<sup>19</sup> Unlike the first Gulf War, the four divisions to participate in major combat operations in OIF were in different stages of deployment when combat operations began.<sup>20</sup> While the reception and staging operations were exceptional, the benefit of NCW played out in the onward movement and integration of these units during operations. The reception and integration of combat units represented a level of complexity not seen since the Korean War during the defense of Pusan.<sup>21</sup> Yet, the commander was able to have visibility over all his forces based on a common operating picture and so was able to effectively “plug” units in as they flowed into combat. The implications for operational maneuver and surprise are evident in such an approach.

Strategic and operational leadership, in terms of Battle Command and staff planning processes were significantly affected by NCW. The Secretary of Defense discusses a shift from deliberate planning to “adaptive” planning in the Defense Planning Guidance of 2002 and expands upon it in his annual report to the President. (“We are most ready when we adapt our plans to emerging conditions.”)<sup>22</sup> While this guidance refers to strategic level planning, it is evident that adaptive planning has a place at the operational and tactical levels based on the ability to see the battlespace and share information. NCW enabled three significant factors that impact combat leadership and staff processes at all levels: battle command on the move; commander-centric planning and audacity. While forward, the commander had visibility of his forces and was able to deliver his intent using TACSAT. Rather than developing multiple courses of action, staffs instead focused on developing the commander’s directed course of action, adapting rapidly to changing information. The “fishbowl” effect described above allowed the staff to anticipate early on, and analyze the situation more fully. The fact that the commander had this situational awareness allowed him to assume greater risk. “The ability to calculate the risk, boldly act upon the calculations, and surprise the enemy by action is audacity” and was enabled by NCW.<sup>23</sup>

### **Conclusion: Network-Centric Warfare, Network Enabled Operations, Network Enabled Battle Command?**

Generally, the tenets of NCW in the major combat operations of OIF certainly *enabled* operations but did not change the human nature of warfare, nor was the “fog and friction” of war eliminated by networked platforms and increased situational awareness. NCW therefore is not a panacea or substitute for the principles of war or the art of command but it certainly enhanced the ability of commanders to conduct combat operations and collaborate in ways that are unprecedented. The U.S. Army War College study provides evidence that demonstrates new information systems, sensors, and extended connectivity

improved combat effectiveness. There is, and will continue to be, fog and friction in war. Understanding the art of command remains a key to success. Constant and effective individual and collective training remain essential to smooth functioning operations. Networked systems do not, of and by themselves, solve problems. They simply enable the abilities of commanders, staffs and operators who are trained individually and collectively to exploit the enhanced situational awareness the network provides.<sup>24</sup>

One can argue about whether the term Network Centric Warfare is accurate or whether Network Enabled Operations or even Network Enabled Battle Command is a better reflection of the operational concept.<sup>25</sup> But the theoretical tenets of NCW put into practice during OIF major combat operations enhanced the ability of U.S. forces to conduct battles and campaigns by providing a common operating picture and situational awareness never before experienced in combat and provided a glimpse at significant operational level of war implications. As technology improves, these implications will become ever more important regarding the way the United States military conducts land warfare.

The Army War College currently is conducting a second phase of the study that will: highlight changes and modifications to doctrinal information and communication architecture/infrastructure of the V Corps and 3ID; synthesize, based on the change of the baseline architecture to the OIF architecture, the effect this new networked architecture made on the processes and organization of V Corps and 3ID and; continue the robust analysis of additional strategic and operational implications of Net Centric Operations based on major combat operations of 3ID and V Corps. The study should be completed in the late summer of 2006.

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<sup>1</sup> Carl Von Clausewitz, *On War*, trans. Michael Howard and Peter Paret (Princeton University Press, 1984).

<sup>2</sup> David Talbot, "How Tech Failed Him," *Technology Review*, November 2004.

<sup>3</sup> Maryann Lawlor, "War Validates Netcentricity Concept," *Signal*, November 2005 [cited April 20, 2006], available from <http://www.afcea.org/signal/articles/anmviewer.asp?a=1041&z=41>.

<sup>4</sup> Arthur K. Cebrowski and John Garstka, J., "Network Centric Warfare: Its Origins and Future," *Proceedings: U.S. Naval Institute* 124, no. 1 (1998).

<sup>5</sup> David S. Alberts, John Garstka, J., and Frederick P. Stein, *Network Centric Warfare: Developing and Leveraging Information Superiority* (Washington, D.C.: DoD Command and Control Research Program, 2002).

<sup>6</sup> Edward Allen Smith, *Effects Based Operations: Applying Network Centric Warfare in Peace, Crisis, and War* (Washington, D.C.: Department of Defense Command and Control Research Program, 2002).

<sup>7</sup> Alberts, Garstka, and Stein, *Network Centric Warfare: Developing and Leveraging Information Superiority*.

<sup>8</sup> Dennis Murphy, *Network Enabled Operations in Operation Iraqi Freedom: Initial Impressions* (Center for Strategic Leadership, U.S. Army War College, 2005 [cited May 9 2005]); available from <http://www.carlisle.army.mil/usacsl/Publications/06-05.pdf>.

<sup>9</sup> United States Army War College, "Network Centric Warfare Case Study: U.S. V Corps and 3rd Infantry Division (Mechanized) During Operation Iraqi Freedom (Mar-Apr

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2003)," (Carlisle Barracks, PA: Office of Force Transformation, Office of the Secretary of Defense, 2005), p. E-6-19.

<sup>10</sup> Ibid. ADOCS integrates the following systems into a common operational picture: Advance Field Artillery Tactical Data System (AFTADS), Global Command and Control System (GCCS), Tactical Airspace Integration System (TAIS), Theater Battle Management Core System (TBMCS), Imagery Intelligence, Joint Weather Service (JWS), numerous radar systems, All-Source Analysis System (ASAS), Common Ground Sensor (CGS), Unmanned Aerial Vehicles (UAVs), Command and Control Personal Computer (C2PC), and Air Defense System Integrator (ADSI).

<sup>11</sup> Ibid. p. E-61.

<sup>12</sup> Tarra Copp and Scripps Howard, "Unmanned Vehicles Clutter Air above Iraq," *Arizona Daily Star*, October 28 2005.

<sup>13</sup> United States Army War College, "Network Centric Warfare Case Study: U.S. V Corps and 3rd Infantry Division (Mechanized) During Operation Iraqi Freedom (Mar-Apr 2003)." p. 61.

<sup>14</sup> Ibid. p. 42. LTG Wallace commenting on the importance of voice communications (TACSAT) as the integrating piece of technology with the other elements of the Corps information systems architecture.

<sup>15</sup> Ibid.

<sup>16</sup> Alberts, Garstka, and Stein, *Network Centric Warfare: Developing and Leveraging Information Superiority*, p. 88.

<sup>17</sup> United States Army War College, "Network Centric Warfare Case Study: U.S. V Corps and 3rd Infantry Division (Mechanized) During Operation Iraqi Freedom (Mar-Apr 2003)." p. 61.

<sup>18</sup> Ibid., Annex E, p. 59.

<sup>19</sup> U.S. Department of Defense, *Joint Publication 1-02: DOD Dictionary of Military and Associated Terms* (U.S. Department of Defense, 2005 [cited January 13 2006]); available from <http://www.ditc.mil>.

<sup>20</sup> Gregory Fontenot, E.J. Degen, and David Tohn, *On Point: The United States Army in Operation Iraqi Freedom* (Fort Leavenworth, KS: Combat Studies Institute, 2004).

<sup>21</sup> United States Army War College, "Network Centric Warfare Case Study: U.S. V Corps and 3rd Infantry Division (Mechanized) During Operation Iraqi Freedom (Mar-Apr 2003)." p. 20.

<sup>22</sup> U.S. Department of Defense, *Annual Report to the President and Congress* (Department of Defense, 2003 [cited January 13 2006]), p. 47.

<sup>23</sup> United States Army War College, "Network Centric Warfare Case Study: U.S. V Corps and 3rd Infantry Division (Mechanized) During Operation Iraqi Freedom (Mar-Apr 2003)." p. 68.

<sup>24</sup> Murphy, *Network Enabled Operations in Operation Iraqi Freedom: Initial Impressions* ([cited]).

<sup>25</sup> William S. Wallace, "Network-Enabled Battle Command," *Military Review* LXXXV, no. 3 (2005). p. 2.